

Fuels Workshop on Regulatory and Non-Regulatory Fuels Activities for 2006

October 27, 2006

California Environmental Protection Agency



Air Resources Board

Agenda

- ➡ Introductions and Schedule
- ➡ California Predictive Model
 - Emissions Inventory
 - Reactivity of Evaporative Emissions
 - 2006 Draft Predictive Model - Statistics
- ➡ E-85 Demonstration Program
- ➡ Presentations by Others
- ➡ Open Discussions
- ➡ Closing Remarks

Tentative Future 2006 Workshops

- ➡ November 17, 2006 from 9:00 a.m. to 12:30 p.m. in the Byron Sher Auditorium
 - This workshop will be webcast. All meetings will be available by conference call.
 - Next set of workshops will be scheduled based on progress



A solid red map of the state of California is positioned in the center-left of the slide. The text "Emissions Inventory" is overlaid on the map.

Emissions Inventory

Emissions Inventory

- ➡ ARB staff has identified an issue with the emission inventory pertaining to the hour by hour CRC E-65 SHED data.
- ➡ Staff has discovered that hydrocarbon responses used to calculate permeation values were not corrected for ethanol and MTBE.
- ➡ Permeation results with the corrected data should be ready next week

A solid red map of the state of California is positioned behind the title text.

Reactivity of Evaporative Emissions

Reactivity Issues of Draft PM

- ➡ Data sets for Diurnal, Hot Soak and Exhaust obtained from in-use testing at El Monte (E6 Fuel)
- ➡ Reactivity calculated using draft MIR 2006 list
- ➡ Exhaust reactivity for summertime blends only
- ➡ Permeation reactivity from CRC E-65 study

Exhaust Reactivity

- ➡ Data sets for Exhaust obtained from in-use testing at El Monte (E6 Fuel)
- ➡ Reactivity was calculated for Bag 1 (cold start) and Bag 2 (steady state)
- ➡ Weighting was calculated based on miles driven
- ➡ 1.2 miles for Bag 1 and 8.6 miles for Bag 2

Reactivity of Evaporative Emissions (draft)

| ARB In-use Data | Evap Emissions | | | Average | | |
|-----------------------|----------------|------|------|---------|---------|----------|
| | DL/Rest | HS | RL | Evap | Exhaust | EtOH wt% |
| Unweighted (no MeOH) | 2.68 | 3.15 | 2.73 | 2.79 | 4.01 | |
| Fleet weighted | 2.70 | 3.10 | 2.73 | 2.79 | 3.97 | |
| EtOH wt% | 27% | 33% | 8% | | | 19% |
| Weightings by Process | 32% | 18% | 50% | | | |
| CRC E-65 Data | | | | Average | | |
| | | | | 3.29 | | 28% |
| | | | | 3.47 | | 10% MTBE |

A solid blue map of the state of California is positioned in the center-left of the slide. It is oriented vertically, with the northern part at the top and the southern part at the bottom. The map is a uniform blue color, matching the background gradient.

2006 Draft Predictive Model

2006 Draft Predictive Model

2010 Statewide, Tech 1-5 (GVW 5,750 lbs)

| Pollutant | Emission (tpd) | MIR | OFP (tpd) |
|-----------|-------------------|------|--------------|
| Exh TOG | 249 | 4.01 | 998 |
| CO | 4378 | 0.06 | 263 |
| Evap TOG | | | |
| DI/RT | 118 | 2.68 | 316 |
| HS | 64 | 3.04 | 195 |
| RL | 170 | 2.73 | 464 |
| Perm | TBD | 3.29 | TBD |

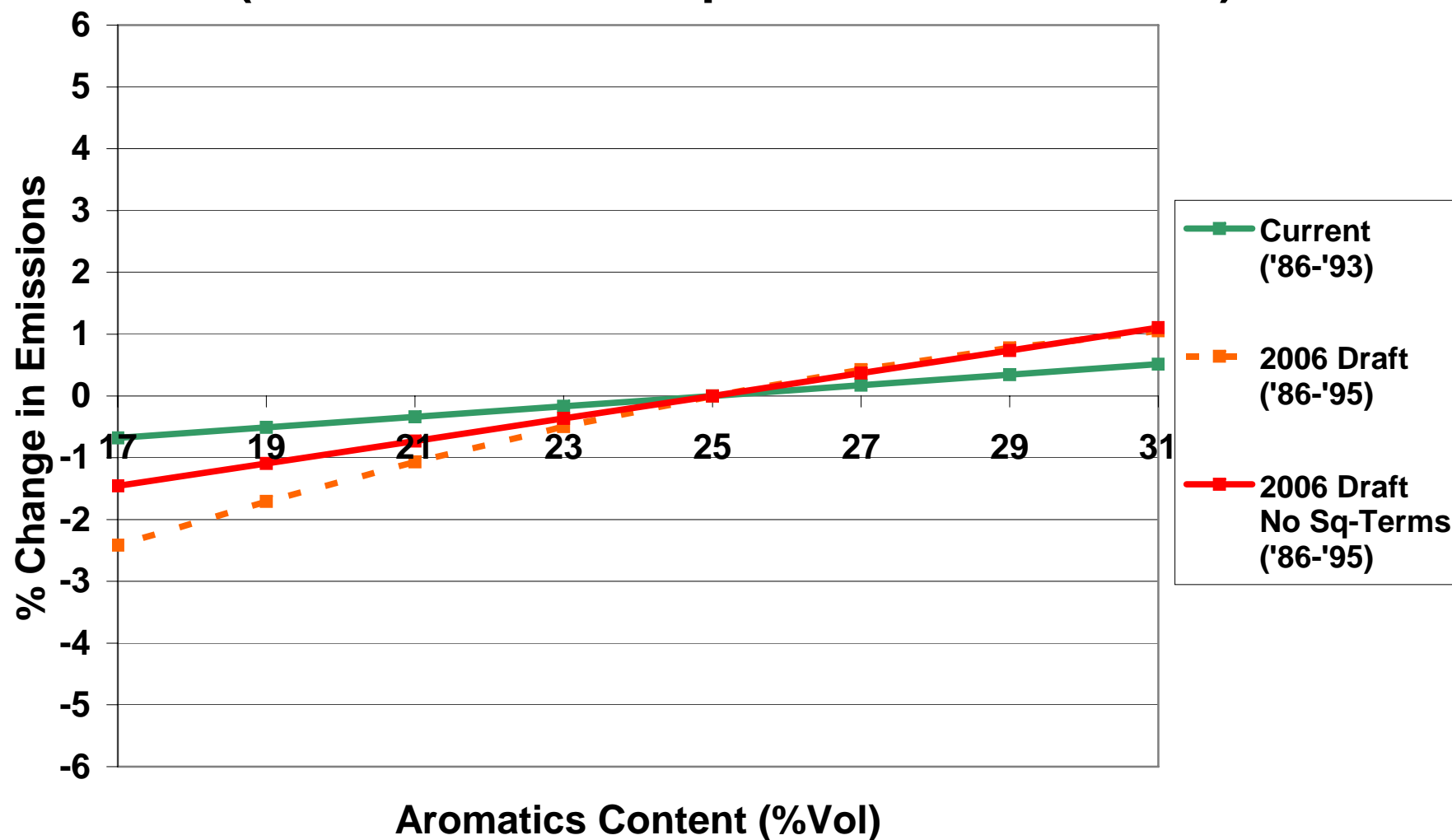
A solid red map of the state of California is positioned in the background, centered vertically and horizontally. It is partially obscured by the title text.

NOx Response to Fuel Properties

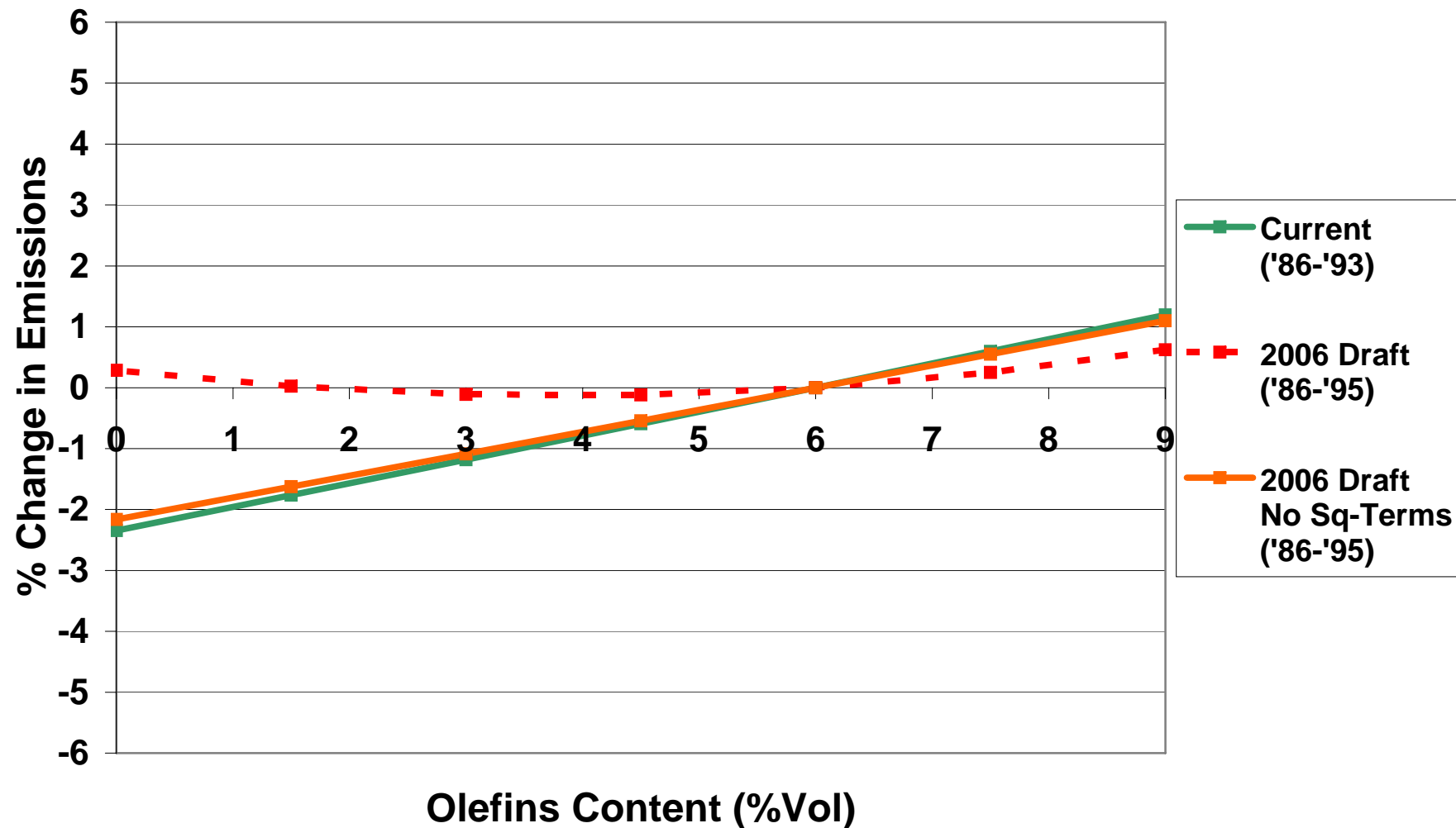
WSPA Concerns with NOx Response:

- ➡ # 1 Aromatics: slope gets steeper (vol < 25%)
- ➡ # 2 Olefins: Overall response gets flatter

Tech 4 NOx Response to Aromatics (All Other Fuel Properties @ Flat Limits)



Tech 4 NO_x Response to Olefins (All Other Fuel Properties @ Flat Limits)



Conclusion of NOX Investigation:

- ➡ The condensed database is not the culprit of NOx response
- ➡ This issue was addressed in 1999
- ➡ Linear responses will be used for aromatics and olefins

A solid red map of the state of California is positioned in the center-left of the slide. The text "E85 Demonstration Program" is overlaid on the map.

E85 Demonstration Program

E85 Demonstration Program

- ➡ Joint venture between ARB, Caltrans, Chevron, General Motors, Pacific Ethanol, CEC, and other state agencies
- ➡ One year program using up to 100,000 gallons E85
- ➡ The agreement was signed in December 2005
- ➡ Ethanol supplied by Pacific Ethanol
- ➡ E85 blended at Chevron's facilities in Richmond
- ➡ E85 meets ASTM D 5798-99 specifications

E85 Demonstration Program

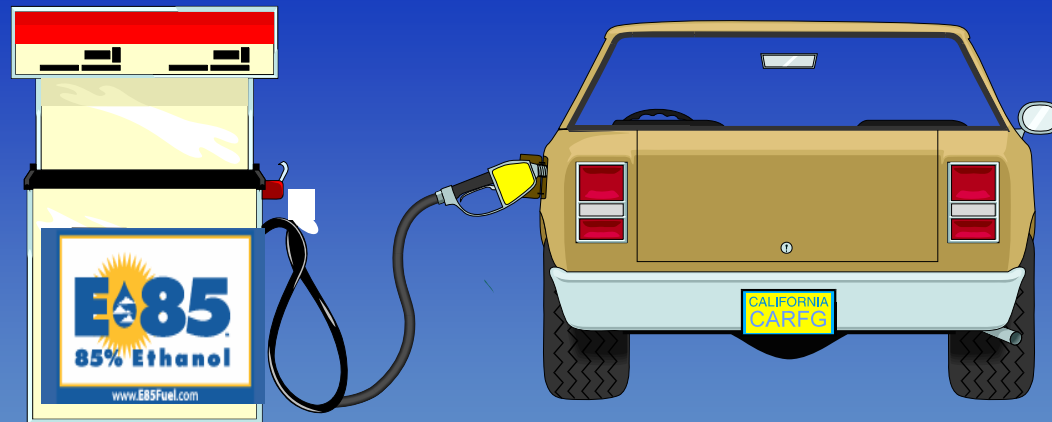
- ✎ 5,000 gallon above ground storage tanks and dispensers installed at Caltrans maintenance stations in Oakland and Marysville
 - Equipment supplied by Dresser Wayne, Bryant Fuel Systems, and CleanFuel USA
 - E85 compatible
 - Design reviewed and approved by State Fire Marshal
 - ARB prepared permit applications
 - Construction from July 24 to Oct 27
 - Phase I vapor recovery
 - Point of sale (POS) card system used to authorize dispensing of fuel

E85 Demonstration Program

- ➡ 50 new flexible fuel vehicles from Caltrans fleet
 - Davis Instruments CarChips installed on 20 vehicles to record vehicle trip and engine performance data
- ➡ First fuel deliveries Oct 5-9
- ➡ Program kick-off orientations held Oct 11-12
- ➡ ARB will evaluate POS card and CarChip data
- ➡ ARB to evaluate evaporative and exhaust emissions on CaRFG and E85.

E85 Demonstration Program

- Chevron also evaluating three different FFV compatible engine oils
- Program steering committee will meet at least quarterly to manage the program after inception
- ARB will compile end of program report



E85 Demonstration Program



Presentations by Others

Open Discussions

Closing Remarks